IN THE CLAIMS:

Please cancel claims 1-53 without prejudice.

Please add the following claims:

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54. An obesity (OB) polypeptide having about 145 to about 167 amino acids, capable of modulating body weight in an animal, or allelic variants or analogs, including fragments, thereof having the same biological activity.

55. An OB polypeptide of claim 54, comprising the amino acid sequence of SEQ ID NOS: 2, 4, 5 or 6, or allelic variants or analogs, including fragments, thereof.

56. An immunogenic fragment of an OB polypeptide according to claim 54.

57. An immunogenic fragment of an OB polypeptide selected from the group consisting of :

Val-Pro-Ile-Gln-Lys-Val-Gln-Asp-Asp-Thr-Lys-Thr-Leu-Ile-Lys-Thr (SEQ ID NO: 18);

Leu-His-Pro-Ile-Leu-Ser-Leu-Ser-Lys-Met-Asp-Gln-Thr-Leu-Ala (SEQ ID NO: 19);

Ser-Lys-Ser-Cys-Ser-Leu-Pro-Gln-Thr-Ser-Gly-Leu-Gln-Lys-Pro-Glu-Ser-Leu-Asp (SEQ ID NO: 20); and

Ser-Arg-Leu-Gln-Gly-Ser-Leu-Gln-Asp-Ile-Leu-Gln-Gln-Leu-Asp-Val-Ser-Pro-Glu-Cys (SEQ ID NO: 21).

58. A human OB polypeptide analog according to claim 55 wherein one or more amino acids selected from the group consisting of amino acids 53, 56, 71, 85, 89, 92, 95, 98, 110, 118, 121, 122, 126, 127, 128, 129, 132, 139, 157, 159, 163, and 166 (according to the numbering of SEQ ID NO: 4) is substituted with another amino acid.

59. A human OB polypeptide analog according to claim 58 wherein substitution is with the divergent amino acid of the mouse OB polypeptide as set out in SEQ ID NO: 2.

60. A human OB polypeptide analog according to claim 58 wherein substitution is with an alanine.

61. A human OB polypeptide analog according to claim 58 selected from the group consisting of polypeptides wherein:

(a) the serine residue at position 53 is substituted with glycine, alanine, valine, cysteine, methionine, or threonine;

(b) the serine residue at position 98 is substituted with glycine, alanine, valine, cysteine, methionine, or threonine; and

(c) the arginine residue at position number 92 is substituted with asparagine, lysine, histidine, glutamine, glutamic acid, aspartic acid, serine, threonine, methionine, or cysteine.

62. An OB polypeptide analog according to claim 55 having 83 percent or greater amino acid sequence homology to the human OB polypeptide amino acid sequence set out in SEQ ID NOS: 2, 4, 5 or 6.

63. A human OB polypeptide analog according to claim 55 selected from the group consisting of polypeptides wherein:

(a) one or more aspartic acid residues is substituted with glutamic acid;

(b) one or more isoleucine residues is substituted with leucine;

(c) one or more glycine or valine residues is substituted with alanine;

(d) one or more arginine residues is substituted with histidine;

(e) one or more tyrosine or phenylalanine residues is substituted with tryptophan;

(f) one or more of residues 121 through 128 (according to the numbering of SEQ ID No:4) is substituted with glycine or alanine; and

(g) one or more residues at positions 54 through 60 or 118 through 166 (according to the number of SEQ ID NO: 4) is substituted with lysine, glutamic acid, cysteine, or proline.

64. An OB polypeptide according to claim 54 selected from the group consisting of polypeptides:

(a) having residues 1 through 21 deleted; and

(b) polypeptides of subpart (a) having a methione at position 21, or having a glycine-serine-histidine-methionine sequence (SEQ ID NO: 38) at positions 18 through 21, or having a methionine-glycine-serine-serine-histidine-histidine-histidine-histidine-histidine-histidine-serine-serine-glycine-leucine-valine-proline-arginine-glycine-serine-histidine-methionine sequence (SEQ ID NO: 98) at positions 1 through 21.

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65. An OB polypeptide according claim 54 selected from the group consisting of polypeptides:

(a) having residues 1 through 21 deleted; and

(b) polypeptides of subpart (a) having a leucine-glutamic acid-lysine-arginine-glutamic acid-alanine-glutamic acid-alanine sequence (SEQ ID NO: 26) at positions 14 through 21, or having a glutamic acid-alanine-glutamic acid-alanine sequence (SEQ ID NO: 27) at positions 18 through 21, or having a leucine-glutamic acid-lysine-arginine sequence (SEQ ID NO: 28) at positions 18 through 21, or having a methionine-glycine-serine-serine-histidine-histidine-histidine-histidine-histidine-histidine-serine-serine-glycine-leucine-valine-proline-arginine-glycine-serine-proline sequence (SEQ ID NO: 99) at positions 2 through 21, or having a glycine-serine-proline sequence at positions 18 through 21.

66. An OB polypeptide according to claim 58 selected from the group consisting of polypeptides:

(a) having residues 1 through 21 deleted; and

(b) polypeptides of subpart (a) having a methione at position 21, or having a glycine-serine-histidine-methionine sequence (SEQ ID NO: 38) at positions 18 through 21, or having a methionine-glycine-serine-serine-histidine-histidine-histidine-histidine-histidine-histidine-serine-serine-glycine-leucine-valine-proline-arginine-glycine-serine-histidine-methionine sequence (SEQ ID NO: 98) at positions 1 through 21, or having a leucine-glutamic acid-lysine-arginine-glutamic acid-alanine-glutamic acid-alanine sequence (SEQ ID NO: 26) at positions 14 through 21, or having a glutamic acid-alanine-glutamic acid-alanine sequence (SEQ ID NO: 27) at positions 18 through 21, or having a leucine-glutamic acid-lysine-arginine sequence (SEQ ID NO: 28) at positions 18 through 21, or having a methionine-glycine-serine-serine-histidine-histidine-histidine-histidine-histidine-histidine-serine-serine-glycine-leucine-valine-proline-arginine-glycine-serine-proline sequence (SEQ ID NO: 99) at positions 2 through 21, or having a glycine-serine-proline sequence at positions 18 through 21.

67. A human OB polypeptide truncated analog according to claim 55 selected from the group (according to the numbering of SEQ ID NO: 4) consisting of polypeptides wherein:

(a) one or more residues at positions 121 to 128 are deleted;

(b) residues 1-116 are deleted;

(c) residues 1-21 and 54 to 167 are deleted;

(d) residues 1-60 and 117 to 167 are deleted;

(e) residues 1-60 are deleted;

(f) resides 1-53 are deleted;

(g) an analog of subpart (a) wherein residues 1-21 are deleted; and

(h) an analog of subpart (a) through (g) having an N-terminal amino acid or amino acid sequence selected from the group consisting of:

(1) methionine,

(2) a glycine-serine-histidine-methionine sequence (SEQ ID NO: 38),

(3) a methionine-glycine-serine-serine-histidine-histidine-histidine-histidine-histidine-histidine-serine-serine-glycine-leucine-valine-proline-arginine-glycine-serine-histidine-methionine sequence (SEQ ID NO: 98),

(4) a leucine-glutamic acid-lysine-arginine-glutamic acid-alanine-glutamic acid-alanine sequence (SEQ ID NO: 26),

(5) a glutamic acid-alanine-glutamic acid-alanine sequence (SEQ ID NO: 27),

(6) a leucine-glutamic acid-lysine-arginnine sequence (SEQ ID NO: 28),

(7) a methionine-glycine-serine-serine-histidine-histidine-histidine-histidine-histidine-histidine-serine-serine-glycine-leucine-valine-proline-arginine-glycine-serine-proline sequence (SEQ ID NO: 99), and

(8) a glycine-serine-proline sequence.

68. A recombinant OB polypeptide according to claim 54.

69. A chemically synthesized OB polypeptide according to claim 54.

70. A derivative of an OB polypeptide according to claim 54 having one or more chemical moieties attached thereto.

71. A derivative of claim 70, wherein the chemical moiety is a water-soluble polymer.

72. A derivative of claim 71, wherein the water-soluble polymer is polyethylene glycol.

73. A derivative of claim 72 which is mono-, di-, tri- or tetrapegylated.

74. A derivative of claim 73 which is N-terminal monopegylated.

75. A derivative of claim 74 which is an OB polypeptide comprising the amino acid residues 22 through 167 of SEQ ID NO:4 or residues 22 through 166 of SEQ ID NO: 6.

76. A derivative of claim 74 which is an OB polypeptide comprising the amino acid sequence of residues 22 through 167 of SEQ ID NO: 4 or residues 22 through 166 of SEQ ID NO: 6 and having a methionine at position 21.

77. An isolated nucleic acid molecule encoding an OB polypeptide according to claim 54.

78. An isolated nucleic acid molecule encoding an OB polypeptide according to claim 58.

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79. A DNA molecule for use in securing expression of an OB polypeptide having the biological activity of modulating body weight in a mammal, the DNA being selected from the group consisting of:

(a) the DNA molecules set out in SEQ ID NOS: 1 and 3 or fragments thereof,

(b) DNA molecules which hybridize to the DNA molecules defined in (a) or hybridizable fragments thereof; and

(c) DNA molecules that code on expression for the amino acid sequence encoded by any of the foregoing DNA molecules.

80. A DNA molecule according to claim 79 which is the human genomic DNA molecule of SEQ ID NOS: 22 and 24.

81. A DNA molecule according to claim 77 encoding a polypeptide having an amino acid sequence selected from the group consisting of the amino acid sequences set out in:

(a) SEQ ID NO: 2;

(b) amino acids 22 through 167 of SEQ ID NO: 2;

(c) SEQ ID NO: 4;

(d) amino acids 22 through 167 of SEQ ID NO: 4;

(e) SEQ ID NO: 5;

(f) amino acids 22 through 166 of SEQ ID NO: 5;

(g) SEQ ID NO: 6;

(h) amino acid 22 through 166 of SEQ ID NO: 6; and

(i) the amino acid sequences of subpart (b) (d), (f) or (h) having an N-terminal amino acid or amino acid sequence selected from the group consisting of:

(1) methionine,

(2) a glycine-serine-histidine-methione sequence (SEQ ID NO: 38), and

(3) a methionine-glycine-serine-serine-histidine-histidine-histidine-histidine-histidine-histidine-serine-serine-glycine-leucine-valine-proline-arginine-glycine-serine-histidine-methionine sequence (SEQ ID NO: 98).

82. A DNA molecule according to claim 81 encoding an amino acid of subpart (b), (d), (f) or (h) having an N-terminal amino acid sequence selected from the group consisting of:

(1) a leucine-glutamic acid-lysine-arginine-glutamic acid-alanine-glutamic acid-alanine sequence (SEQ ID NO: 26),

(2) a glutamic acid-alanine-glutamic acid-alanine sequence (SEQ ID NO: 27),

(3) a leucine-glutamic acid-lysine-arginine sequence (SEQ ID NO: 28),

(4) a methionine-glycine-serine-serine-histidine-histidine-histidine-histidine-histidine-histidine-serine-serine-glycine-leucine-valine-proline-arginine-glycine-serine-proline sequence (SEQ ID NO: 99), and

(5) a glycine-serine-proline sequence.

83. A DNA molecule according to claim 77 comprising the sequence set out as the protein coding sequence of SEQ ID NO: 3.

84. A DNA molecule according to claim 77 comprising the sequence set out as the sequence encoding amino acids 22 through 167 of SEQ ID NO: 3.

85. A detectably labeled nucleic acid molecule hybridizable to a DNA molecule according to claim 77.

86. A nucleic acid hybridizable to a non-coding region of an OB nucleic acid, which non-coding region is selected from the group consisting of an intron, a 5′ non-coding region, and a 3′ non-coding region.

87. An oligonucleotide primer for amplifying human genomic DNA encoding an OB polypeptide.

88. An oligonucleotide according to claim 85, which is selected from the group consisting of:

HOB 1gF 5′-CCCAAGAAGCCCATCCTG-3′ (SEQ ID NO. 29);

HOB 1gR 5′-GACTATCTGGGTCCAGTGCC-3′ (SEQ ID NO. 30);

HOB 2gF 5′-CCACATGCTGAGCACTTGTT-3′ (SEQ ID NO. 31); and

HOB 2gR 5′-CTTCAATCCTGGAGATACCTGG-3′ (SEQ ID NO. 32).

89. A vector which comprises a DNA molecule according to claim 77.

90. An expression vector which comprises a DNA molecule according to claim 77 operatively associated with an expression control sequence.

91. An expression vector which comprises a DNA molecule according to claim 78 operatively associated with an expression control sequence.

92. An expression vector which comprises a DNA molecule according to claim 79 operatively associated with an expression control sequence.

93. An unicellular host transformed or transfected with an expression vector of claim 89.

94. A unicellular host according to claim 93, wherein the unicellular host is selected from the group consisting of bacteria, yeast, mammalian cells, plant cells, insect cells, and human cells in tissue culture.

95. The unicellular host of claim 93, wherein the unicellular host is selected from the group consisting of *E. coli, Pseudomonas, Bacillus, Streptomyces,* yeast, CHO, R1.1, B-W, LM, COS 1. COS 7, BSC1, BSC40, BMT10, and Sf9 cells.

96. A unicellular host according to claim 93 wherein the unicellular host is a yeast host selected from the group consisting of *Saccharomyces, Pichia, Candida, Hansenula and Torulopsis*.

97. A mammalian cell containing an OB polypeptide encoding DNA sequence and modified in vitro to permit higher expression of OB polypeptide by means of a homologous recombinational event consisting of inserting an expression regulatory sequence in functional proximity to the OB polypeptide encoding sequence.

98. A cell according to claim 97 wherein the expression regulatory sequence is an OB polypeptide expression regulatory sequence and the homologous recombinational event replaces a mutant OB polypeptide expression regulatory sequence.

99. A cell according to claim 98 wherein the expression regulatory sequence insert is not an OB polypeptide regulatory sequence.

100. A method for preparing an OB polypeptide comprising:

(a) culturing a cell according to claim 93 under conditions that provide for expression of the OB polypeptide; and

(b) recovering the expressed OB polypeptide.

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101. The method according to claim 100 wherein the cell is a bacterium or a yeast.

102. The method according to claim 100 further comprising:

(c) chromatographing the OB polypeptide on a Ni-chelation column; and

(d) purifying the OB polypeptide by gel filtration.

103. The method according to claim 102, further comprising after step (c) and before step (d) chromatographing the OB polypeptide on a strong cation exchanger column.

104. An antibody specific for an OB polypeptide according to claim 54.

105. An antibody according to claim 104 which is a monoclonal or polyclonal antibody.

106. An antibody according to claim 105 labeled with a detectable label.

107. An immortal cell line that produces a monoclonal antibody according to claim 104.

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108. A method for preparing an antibody specific to an OB polypeptide, comprising:

(a) conjugating an OB polypeptide of claim 54 to a carrier protein;

(b) immunizing a host animal with the OB polypeptide fragment-carrier protein conjugate of step (a) admixed with an adjuvant; and

(c) obtaining antibody from the immunized host animal.

109. A method for measuring the presence of an OB polypeptide in a sample, comprising:

(a) contacting a sample suspected of containing an

OB polypeptide with an antibody that specifically binds to the OB polypeptide under conditions which allow for the formation of reaction complexes comprising the antibody and the OB polypeptide; and

(b) detecting the formation of reaction complexes comprising the antibody and OB polypeptide in the sample,

wherein detection of the formation of reaction complexes indicates the presence of OB polypeptide in the sample.

110. The method of claim 109 in which the antibody is bound to a solid phase support.

111. A method for evaluating the level of OB polypeptide in a biological sample comprising:

(a) detecting the formation of reaction complexes in a biological sample according to the method of claim 109 or 110; and

(b) evaluating the amount of reaction complexes formed, which amount of reaction complexes corresponds to the level of OB polypeptide in the biological sample.

112. A method for detecting or diagnosing the presence of a disease associated with elevated or decreased levels of OB polypeptide in a mammalian subject comprising:

(a) evaluating the level of OB polypeptide in a biological sample from a mammalian subject according to claim 111; and

(b) comparing the level detected in step (a) to a level of OB polypeptide present in normal subjects or in the subject at an earlier time,

wherein an increase in the level of OB polypeptide as compared to normal levels indicates a disease associated with elevated levels of OB polypeptide, and decreased level of OB polypeptide as compared to normal levels indicates a disease associated with decreased levels of OB polypeptide.

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113. A method for monitoring a therapeutic treatment of a disease associated with elevated or decreased levels of OB polypeptide in a mammalian subject comprising evaluating the levels of OB polypeptide in a series of biological samples obtained at different time points from a mammalian subject undergoing a therapeutic treatment for a disease associated with elevated or decreased levels of OB polypeptide according to the method of claim 111.

114. A pharmaceutical composition comprising an OB polypeptide according to claim 54 and a pharmaceutically acceptable carrier.

115. A method of reducing the body weight of an comprising administering to the animal an effective amount of a pharmaceutical composition of claim 61.

116. A pharmaceutical composition for increasing the body weight of an animal comprising an antagonist of an OB polypeptide according to claim 54 and a pharmaceutically acceptable carrier.

117. The pharmaceutical composition of claim 116, wherein the antagonist is selected from the group consisting of an antibody that binds to and neutralizes the activity of the OB polypeptide, a fragment of the OB polypeptide that binds to but does not activate the OB polypeptide receptor, and a small molecule antagonist of the OB polypeptide.

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118. A body appearance improving cosmetic composition for reducing the body weight of an individual comprising an OB polypeptide according to claim 54 and an acceptable carrier.

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119. A method for improving cosmetic body appearance by reducing the body weight of an individual comprising administering the cosmetic composition of claim 118.

120. A cosmetic composition for increasing the body weight of an animal comprising an antagonist of an OB polypeptide according to claim 54.

121. The cosmetic composition according to claim 120, wherein the antagonist is selected from the group consisting of an antibody that binds to and neutralizes the

activity of the OB polypeptide, a fragment of the OB polypeptide that binds to but does not activate the OB polypeptide receptor, and a small molecule antagonist of the OB polypeptide.

122. A cosmetic process for improving the body appearance of an individual, comprising administering the cosmetic composition according to claim 120 to the individual in a dose amount sufficient to increase the individual's body weight to a desired level.

123. A method for modifying body weight of a mammal comprising administering an antisense nucleic acid molecule hybridizable to a nucleic acid encoding an OB polypeptide according to claim 54 to the mammal.

124. A method for modifying the body weight of a mammal comprising administering a nucleic acid molecule encoding an OB polypeptide according to claim 54 to the mammal under conditions that provide for expression of the OB polypeptide *in vivo*.

125. A method for modifying body weight of an animal comprising administering an effective amount of the OB polypeptide according to claim 54 to the animal.

126. The method according to claim 125 wherein modifying the body weight of a mammal is for treating a disorder selected from the group consisting of diabetes, high blood pressure and high cholesterol.

127. The method according to claim 125, further comprising administering an effective amount of a medicament for treating diabetes, high blood pressure and high cholesterol.

128. A method for increasing body weight of an animal comprising administering an effective amount of an antagonist of an OB polypeptide according to claim 54.

129. The method according to claim 128 wherein the antagonist is selected from the group consisting of an antibody that binds to and neutralizes the activity of the OB polypeptide, a fragment of the OB polypeptide that binds to but does not activate the OB receptor, and a small molecule antagonist of the OB polypeptide.

130. The method according to claim 125 wherein the OB polypeptide is administered by intravenous, intraarterial, intraperitoneal, intramuscular, subcutaneous, nasal, oral or pulmonary delivery.

131. The method according to claim 128 wherein the OB polypeptide is administered by intravenous, intraarterial, intraperitoneal, intramuscular, subcutaneous, nasal, oral or pulmonary delivery. --